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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,284	04/19/2004	Cheng-Lin Yang	3313-1161PUS1	9924
2292	7590	10/04/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			PETKOVSEK, DANIEL J	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/826,284

Applicant(s)

YANG ET AL.

Examiner

Daniel J. Petkovsek

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on application filed on April 19, 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on April 19, 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/19/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This office action is in response to the application filed April 19, 2004.

#### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### *Information Disclosure Statement*

2. The prior art document submitted by Applicant in the Information Disclosure Statements filed on April 19, 2004, has been considered and made of record (note attached copy of forms PTO-1449).

#### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Oh et al. U.S.P. No. 6,303,040 B1.

Oh et al. U.S.P. No. 6,303,040 B1 teaches (Fig. 1C, column 3, line 60 through column 4, line 33) a tunable filter comprising: a polymer waveguide 5, a “micro” grating 1 installed on the surface of the polymer waveguide 5 to reflect the optical signal to another path, wherein the grating 1 is formed in a polymer film, in which the refractive index of the grating inherently varies with temperature (in a sense “tunable” by any change in temperature, since Applicant has

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not claimed any control/tuning means in the body of the claim), which clearly, fully meets Applicant's *claimed* limitations.

It is noted that Applicant is claiming a product, not a method of making. The use of "formed by first defining a stripe photoresist", "using interference of two laser beams", and "etching the polymer film" are method limitations. The Patent being sought in claim 1 is an end product that is met by the Oh et al. reference. The U.S. Patent Office is not equipped to experiment or test the myriad of ways or processes in which a preliminary member may be made to determine whether the claimed product by process contains some technical advantage over that of the prior art. Additionally, it is Applicant's responsibility to prove that the process claimed has some beneficial improvement over the process of the prior art. Examiner would also point out that these limitations have been considered for their patentability in any method claim.

#### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh et al. U.S.P. No. 6,303,040 B1, and further in view of Nikonov U.S.P. No. 6,522,812 B1 and Xu et al. US 2003/0207215 A1.

Applicant asserts that Oh et al. U.S.P. No. 6,303,040 B1 teaches the claimed invention, but fails to teach or reasonably suggest the specific method in which the "micro" grating is formed (see Summary, page 2 of Applicant's specification). The part that Applicant asserts is

novel about the claims are the method steps, for example forming a photoresist stripe, exposing the photoresist by using laser interference, removing the photoresist, and etching to form the grating. (Independent claims 5 and 10). However, Oh et al. '040 teaches (column 4, lines 16-33) that conventional methods using laser light interference are well known to make fabricate optical gratings.

Nikonov U.S.P. No. 6,522,812 B1 teaches (Figs. 3 and 4; column 4, line 52 through column 5, line 33) an optical polymer waveguide/grating in which explicit patterning and etching steps in which photoresist is patterned by using two laser beam interference, and the grating is formed by etching as a result of the defined grating patterns.

Xu et al. US 2003/0207215 A1 teaches (Fig. 35, [0280]-[0281]) specific advantages to using two-beam interference in the art of planar waveguide gratings devices, and the formation of the grating period as such. Xu et al. '215 also discloses that using this type of interference allows for the advantage of being able to change the grating period based on angles of the interference.

Since Oh et al. '040, Nikonov '812, and Xu et al. '215 are both from the same field of endeavor, the purposes disclosed by Nikonov '812 and Xu et al. '215 would have been recognized in the pertinent art of Oh et al. '040.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the improved use of fabricating the optical grating structure of Oh et al. '040 by the process steps as disclosed by the art of Nikonov '812 and Xu et al. '215 for the purpose of improving adjustability of the grating periods and for improving optical coupling as such.

Regarding claims 3, 4, 6, and 7, the art of Nikonov '812 and Xu et al. '215 both teach applications in which the waveguide gratings are in rib/ridge waveguide forms.

Regarding claims 2, 9, and 12, although the prior art does not explicitly teach a range of 400 to 600 nm, since the Xu et al. '215 reference explicitly discloses that one of the advantages of using this type of laser interference is for the purpose of being able to change the grating period based upon the desired angles, a person having ordinary skill in the art at the time the invention was made would have realized a purpose of fabricating an optimum range of grating period, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 8 and 11, although the specific etching process is not disclosed by the prior art, a person having ordinary skill in the art would have recognized using any well known form of etching, for example ICP etching. ICP etching is known in the art to improve accuracy and depth of etching in semiconductor process. Further, it is noted that Applicant has not asserted any criticality of using the specific form of etching as so claimed.

7. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blomquist et al. U.S.P. No. 6,768,839 B2, and further in view of Nikonov U.S.P. No. 6,522,812 B1 and Xu et al. US 2003/0207215 A1.

Blomquist et al. '839 teaches (ABS, Fig. 4, column 2, lines 15-26, column 3, lines 50-56) a tunable filter comprising: a polymer fiber waveguide 4, a "micro" fiber grating 8 on the surface

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of the fiber waveguide, in which the grating is formed of a polymer material by use of a light interference beam pattern to create the grating period, in which the grating is tunable due to a heat source 10. Blomquist et al. '839 teaches the embodiment in a fiber apparatus, and does not explicitly teach a planar waveguide embodiment, in which the fabrication process differs to create the tunable filter.

However, a person having ordinary skill in the art would have recognized the similarity between fiber gratings (taught by Blomquist et al. '839) and planar waveguide gratings (as claimed by Applicant), and the only missing disclosure would be the method in which this tunable filter device was fabricated.

Nikonov U.S.P. No. 6,522,812 B1 teaches (Figs. 3 and 4; column 4, line 52 through column 5, line 33) an optical polymer waveguide/grating in which explicit patterning and etching steps in which photoresist is patterned by using two laser beam interference, and the grating is formed by etching as a result of the defined grating patterns.

Xu et al. US 2003/0207215 A1 teaches (Fig. 35, [0280]-[0281]) specific advantages to using two-beam interference in the art of planar waveguide gratings devices, and the formation of the grating period as such. Xu et al. '215 also discloses that using this type of interference allows for the advantage of being able to change the grating period based on angles of the interference.

Since Blomquist et al. '839, Nikonov '812, and Xu et al. '215 are both from the same field of endeavor, the purposes disclosed by Nikonov '812 and Xu et al. '215 would have been recognized in the pertinent art of Oh et al. '040.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the fabrication of a planar waveguide, as opposed to a fiber waveguide of Blomquist et al. '839 by the process steps as disclosed by the art of Nikonov '812 and Xu et al. '215 for the purpose of improving adjustability of the grating periods and for improving optical coupling as such.

Regarding claims 3, 4, 6, and 7, the art of Nikonov '812 and Xu et al. '215 both teach applications in which the waveguide gratings are in rib/ridge waveguide forms.

Regarding claims 2, 9, and 12, although the prior art does not explicitly teach a range of 400 to 600 nm, since the Xu et al. '215 reference explicitly discloses that one of the advantages of using this type of laser interference is for the purpose of being able to change the grating period based upon the desired angles, a person having ordinary skill in the art at the time the invention was made would have realized a purpose of fabricating an optimum range of grating period, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 8 and 11, although the specific etching process is not disclosed by the prior art, a person having ordinary skill in the art would have recognized using any well known form of etching, for example ICP etching. ICP etching is known in the art to improve accuracy and depth of etching in semiconductor process. Further, it is noted that Applicant has not asserted any criticality of using the specific form of etching as so claimed.



*Inventorship*

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

*Conclusion*

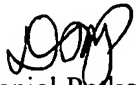
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, with respect to the state of the art of polymer waveguide gratings: PTO-892 form references C, D, and F.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Petkovsek whose telephone number is (571) 272-2355. The examiner can normally be reached on M-F 8:30-5:00.

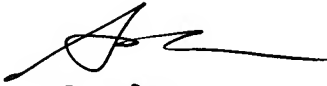
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Petkovsek  
September 29, 2005



Sung Pak  
Patent Examiner  
AU 2874